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This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claim 1 (currently amended): A multichannel deep brain stimulation system (10) comprising:

an implantable pulse generator (20) having means for generating electrical stimuli comprising a plurality of channels and memory circuits, wherein the memory circuits store at least one program; connected to

at least one electrode array (30) connected to said implantable pulse generator, said at least one electrode array having a plurality of electrodes (32) through which electrical stimuli may be applied to body tissue;

a rechargeable battery (27) coupled to the implantable pulse generator;

a hand-held programmer (50); and

an external battery charging system (40);

wherein the implantable pulse generator (20) and said at least one electrode array (30) are adapted to be implanted directly in the cranium of a patient; ~~whereby electrical stimuli may be applied to brain tissue of the patient;~~ and

wherein the means for generating electrical stimuli comprises ~~implantable pulse generator (20) includes~~ control circuits (21, 26, 27) and memory circuits (22, 24) that cause stimulation pulses having parameters specified only by data stored in the memory circuits to be applied through at least one of ~~a plurality~~ the plurality of channels to the electrodes (32) of the at least one electrode array in accordance with ~~a program~~ the at least one program stored within the memory circuits ~~of the implantable pulse generator;~~ and

wherein the hand-held programmer (50) is adapted to communicate with ~~may be coupled to the implantable pulse generator through an RF link (44)~~ for the purpose of programming and testing the implantable pulse generator (20); and

wherein the external battery charging system (40) is adapted to be ~~may be~~

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Inductively coupled to the rechargeable battery (27) for the purpose of replenishing the power stored within the rechargeable battery.

Claim 2 (currently amended): The deep brain stimulation system of Claim 1 further including a manufacturing and diagnostic system (70), the manufacturing and diagnostic system including means for coupling with the implantable pulse generator (20) via RF communication, ~~through an RF link (45).~~

Claim 3 (currently amended): The deep brain stimulation system of Claim 2 wherein the manufacturing and diagnostic system (70) further includes means for coupling with the hand-held programmer (50) via infra-red communication, ~~through an infra-red link (47).~~

Claim 4 (currently amended): The deep brain stimulation system of Claim 1 wherein said at least one electrode array comprises at least two electrode arrays (30, 30') are ~~attached to the implantable pulse generator (20)~~, thereby facilitating bilateral stimulation of the brain of the patient.

Claim 5 (original): The deep brain stimulation system of Claim 5 wherein each of the electrode arrays (30 and 30') includes at least two and as many as sixteen electrodes (32, 32').

Claim 6 (currently amended): The deep brain stimulation system of Claim 1 further including a clinician programmer (60), and wherein the clinician programmer (60) may be coupled to the hand-held programmer (50) via infra-red communication ~~through an infra-red link (46)~~ for the purpose of coupling the clinician programmer with the implantable pulse generator (20).

Claim 7 (currently amended): The deep brain stimulation system of Claim 1 wherein the implantable pulse generator comprises a header connector (22), and wherein the at

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at least one electrode array (30) is detachably connected to the implantable pulse generator (20) through the header a header connector (22).

Claim 8 (currently amended): The deep brain stimulation system of Claim 7 wherein the implantable pulse generator comprises an output circuit (25), and wherein the at least one electrode array (30) is capacitively coupled to the output an output circuit (25) of the implantable pulse generator.

Claim 9 (currently amended): A multichannel bilateral deep brain stimulation system (10) comprising:

- an implantable pulse generator (20) ~~detachably connected to;~~
- a plurality of electrode arrays (30, 30'), each of said plurality of electrode arrays having a plurality of electrodes (32) thereon, and each of said plurality of electrode arrays being detachably connected to said implantable pulse generator through which electrical stimuli may be applied to body tissue;
- processing means (21, 26, 27) and memory means circuits (22, 24) included within the implantable pulse generator, the memory means comprising at least one stimulation program and data, wherein the implantable pulse generator is adapted to generate and apply that cause stimulation pulses to be applied to selected electrodes (32) of the plurality of electrode arrays as defined only by the at least one in accordance with a stimulation program and data stored within the memory means circuits;
- a rechargeable battery (27) included within the implantable pulse generator that provides operating power for the implantable pulse generator;
- means (50) for non-invasively programming the memory means [circuits] with the desired at least one a desired stimulation program and data; and
- means (40) for non-invasively recharging the rechargeable battery.

Claim 10 (new): The deep brain stimulation system of Claim 9 further including a manufacturing and diagnostic system (70), the manufacturing and diagnostic system

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including means for coupling with the implantable pulse generator (20) via RF communication.

Claim 11 (new): The deep brain stimulation system of Claim 10 wherein the manufacturing and diagnostic system (70) further includes means for coupling with the hand-held programmer (50) via infra-red communication.

Claim 12 (new): The deep brain stimulation system of Claim 9 wherein each of the electrode arrays (30, 30') includes at least two and as many as sixteen electrodes (32, 32').

Claim 13 (new): The deep brain stimulation system of Claim 9 further including a clinician programmer (60) and a hand-held programmer.

Claim 14 (new): The deep brain stimulation system of Claim 13 wherein the clinician programmer (60) may be coupled to the hand-held programmer (50) via infra-red communication for the purpose of coupling the clinician programmer with the implantable pulse generator (20).

Claim 15 (new): The deep brain stimulation system of Claim 1 wherein the implantable pulse generator comprises a header connector (22), and wherein each of said plurality of electrode arrays is detachably connected to the implantable pulse generator (20) through the header connector (22).

Claim 16 (new): The deep brain stimulation system of Claim 15 wherein the implantable pulse generator comprises an output circuit (25), and wherein the at least one electrode array (30) is capacitively coupled to the output circuit (25) of the implantable pulse generator.

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Claim 17 (new): A multichannel deep brain stimulation system comprising:

a cranium mountable implantable pulse generator including at least one memory circuit;

data stored within the at least one memory circuit;

at least one electrode array adapted to be detachably connected to the implantable pulse generator, the at least one electrode array including two or more electrodes thereon;

a rechargeable battery coupled to the implantable pulse generator;

an external battery charging system;

wherein the implantable pulse generator is adapted to generate electrical pulses that are defined by parameters specified only by the data stored in the at least one memory circuit.

Claim 18 (new): The system of Claim 17 further comprising a programmer adapted to communicate with the implantable pulse generator.

Claim 19 (new): The system of Claim 17

wherein the implantable pulse generator includes at least two channels,

wherein the two or more electrodes of the at least one electrode array are adapted to be assigned to any of the at least two channels, and

wherein each of the at least two channels is adapted to define a common frequency and pulse duration for the two or more electrodes when such electrodes are assigned to an associated channel.

Claim 20 (new): The system of Claim 17 including means for non-invasively programming the at least one memory circuit.